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Cases of *Vibrio vulnificus* identified among Hurricane Katrina evacuees

To date, seven people, in the area affected by Hurricane Katrina, have been reported to be ill from the bacterial disease, *Vibrio vulnificus*. Four have died. The first cases were reported by the Mississippi Department of Health. *V. vulnificus* can cause an infection of the skin when open wounds are exposed to warm seawater. People at greatest risk for illness from *V. vulnificus* are those with weakened immune systems and the elderly. Because *V. vulnificus* is a bacterium in the same family as the bacteria that causes cholera, some media reports have confused the two pathogens.

As part of the current investigation, CDC and other response agencies are working with health departments in affected states to help identify persons who might be at increased risk for *V. vulnificus* and recommend appropriate treatment for them.

What is *Vibrio vulnificus*?

Vibrio vulnificus is a bacterium that is a rare cause of illness in the United States. The illness is very different from cholera, which is caused by different bacteria, called *Vibrio cholerae*. *V. vulnificus* infections do not spread directly from one person to another, and are a serious health threat predominantly to persons with underlying illness, such as liver disease or a compromised immune system. The organism is a natural inhabitant of warm coastal waters. Infection can occur after a wound is exposed to warm coastal waters where the *V. vulnificus* organism is growing. Infection may also be acquired by eating raw or undercooked seafood from those waters.

CDC receives reports of over 400 *Vibrio* illnesses each year. Of those, about 90 per year are due to *V. vulnificus*. Most *Vibrio vulnificus* illness occurs during warm weather months.

Symptoms of infection with *V. vulnificus*

- Acute illness, with a rapid decline in health following exposure
- If exposed by contamination of an open wound, increasing swelling, redness, and pain at the site of the wound
- Illness typically begins within 1-3 days of exposure, but begins as late as 7 days after exposure for a small percentage of cases
- Fever
- Swelling and redness of skin on arms or legs, with blood-tinged blisters
- Low blood pressure and shock

By contrast, the symptoms of cholera are profuse watery diarrhea, vomiting, cramps, and low-grade fever.

Illness caused by *V. vulnificus*

Wound infections may start as redness and swelling at the site of the wound that then can progress to affect the whole body. *V. vulnificus* typically cause a severe and life-threatening illness characterized by fever and chills, decreased blood pressure (septic shock), and blood-tinged blistering skin lesions (hemorrhagic bullae). Overall, *V. vulnificus* infections are fatal about 40% of the time. Wound infections with *V. vulnificus* are fatal about 20% of the time, and aggressive surgical treatment can prevent death.

How people become infected

V. vulnificus is found in oysters and other shellfish in warm coastal waters during the summer months. Since it is naturally found in warm marine waters, people with open wounds can be exposed to *V. vulnificus* through direct contact with seawater, shellfish, and marine wildlife. There is no evidence for person-to-person transmission of *V. vulnificus*.

Persons who have immunocompromising conditions, and, especially those with chronic liver disease, are particularly at risk for *V. vulnificus* infection when they eat raw or undercooked seafood, particularly shellfish harvested from the Gulf of Mexico, or if they bathe a cut or scrape in marine waters. About three-quarters of patients with *Vibrio vulnificus* infections have known underlying hepatic disease or other immunocompromising illness. Otherwise healthy persons are at much lower risk of *Vibrio vulnificus* infection.

Concerns in hurricane-affected areas

Persons with immunocompromising conditions and especially those with chronic liver disease should avoid exposure of open wounds or broken skin to warm salt or brackish water, and avoid consuming undercooked shellfish harvested from such waters. More information on caring for wounds may be found in the CDC document Emergency Wound Management for Hurricane Professionals.

After a coastal flood disaster, large numbers of persons with illnesses that affect their resistance to infection may be exposed to seawater. Injury prevention is especially important in high risk persons. Wounds exposed to seawater should be washed with soap and water as soon as possible, infected wounds should be evaluated by a doctor, and clinicians should aggressively monitor these wounds.

Diagnosis

V. vulnificus infection is diagnosed by microbiologic culture of the wound, by blood cultures, or by stool culture in the case of patients who consumed raw or undercooked seafood.

Treatment

V. vulnificus infection is treated with antibiotics. When this infection is suspected, treatment with a combination of a third-generation cephalosporin (e.g., ceftazidime) and doxycycline is recommended. *V. vulnificus* wound

infections should be treated with aggressive attention to the wound site; amputation of the affected limb is sometimes necessary.

Recovery

V. vulnificus infection is an acute illness, and those who recover should not expect long-term consequences.

Information about *Vibrio* surveillance may be found at http://www.cdc.gov/foodborneoutbreaks/vibrio_sum.htm

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DEPARTMENT OF HEALTH AND HUMAN SERVICES